Genetic Differences in Rhinos Complicate Conservation Effort

Quandary arises on saving Sumatran breed and subspecies.

By LES LINE

Saving the Sumatran rhinoceros, a shaggy beast unlike any other rhino, is one of the more challenging tasks facing wildlife conservationists. Now the effort may become more complicated because geneticists have confirmed that one of the animal's scattered populations is significantly different from the others and needs its own rescue effort.

Fewer than 400 Sumatran rhinos survive on the Malay peninsula and on the islands of Sumatra and Borneo, occupying a small fraction of the species' former range, the International Rhino Foundation says. It is the remnant Borneo population, numbering about 70 animals, that particularly concerns scientists at Columbia University. They report in the February issue of the journal Conservation Biology that DNA studies clearly distinguish the rhinos on Borneo from other members of the species, indicating that they have been isolated for thousands of years.

Taxonomists recognized the Bornean rhino as a separate subspecies in 1965, based on physical characteristics like skull shape. But some scientists say the outlook for the Sumatran rhinos is so bleak that any differences should be ignored and all of the species' populations managed as a single conservation unit.

Dr. Don Melnick, an evolutionary geneticist who is director of the Center for Environmental Research and Conservation at Columbia, disagrees. "If the remaining rhinos on Borneo are not brought into an area of sufficient size and habitat quality and protected against poachers," he said, "we will lose a unique part of the genetic heritage of this species." He said interbreeding Bornean rhinos with relatives from Sumatra or the Malay peninsula could produce offspring ill-suited to survive and reproduce in the wild.

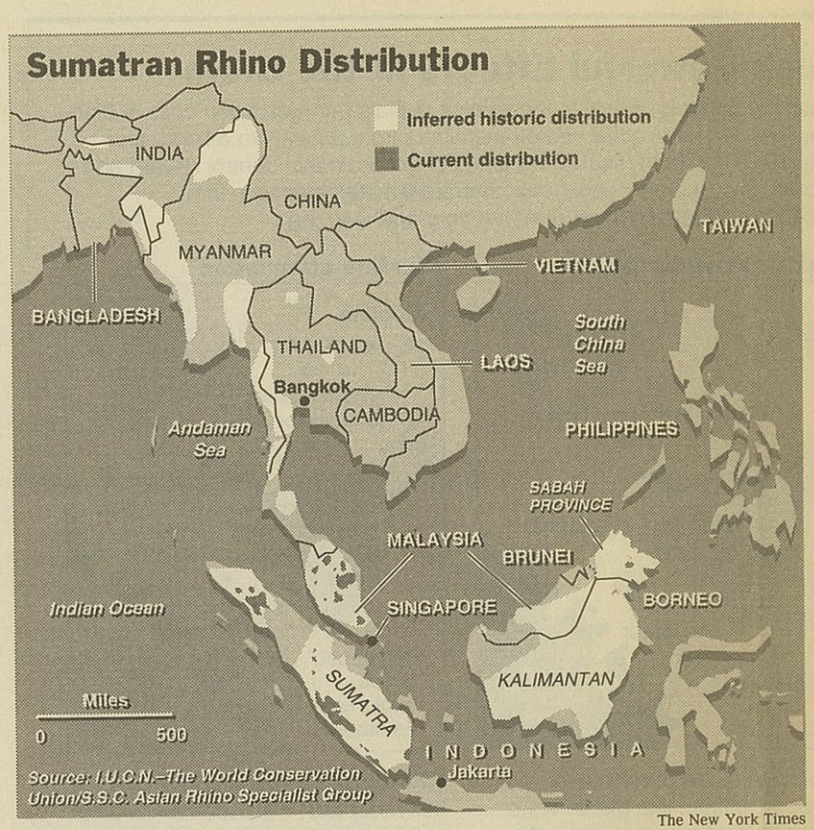
While rhinos were reported to be common in Borneo early in the century, their numbers were severely reduced by the 1950's and they are now known to exist only in the Malaysian state of Sabah in northern Borneo. Dr. Melnick said there were large areas of rhino habitat in Sabah. "It's not a problem of carrying capacity," he said. "We should be so lucky."

He said there were many isolated animals that should be moved into a reserve where they could find mates. "We know from success in Africa that rhinos, if protected, will come back," he said.

The Sumatran rhino, also known as the hairy rhino, once roamed the foothills of the Himalayas in Bhutan and eastern India, the tropical forests of Myanmar (formerly Burma) and Thailand, and possibly Vietnam and China. Hunting was the main cause of the species' eradication from most of its range, and while a few animals may still exist in remote areas, rhino specialists with the Species Survival Commission of IUCN — the World Conservation Union believe that the only viable breeding populations are those in Malaysia and Indonesia.

The smallest of the five species of rhinoceroses, the Sumatran rhino, with its unusual armorlike folds of skin, stands four and a half feet at the shoulders and weighs up to 2,200 pounds. By comparison, the white rhino of southern Africa, the world's largest land mammal except for the African and Asian elephants, is six feet tall and can weigh as much as 8,000 pounds. The habitat of the Sumatran rhino ranges from mountain moss forest to sea-level swamps, and individual animals have permanent home ranges that include salt licks and rainwater ponds for wallowing.

Like the African white and black rhinos, the Sumatran rhino has two horns, but the front one is generally less than a foot long and the second horn is so small that it often appears to be missing, especially in females. An earlier genetic study by Dr. Melnick and a Columbia colleague, Dr. Juan Carlos Morales, published in the journal Molecular Phylogenetics and Evolution in 1994, resolved a long-running dispute among scientists over the classification of rhinos. They showed that the Sumatran rhino was closely related to the African species rather than to the one-horned Asian species — the greater Indian rhino and Javan rhino — as some authors had argued.



The New York Times

The Sumatran rhinoceros occupies a fraction of its former range, and the population in Borneo numbers only about 70. This remnant is also genetically different from the other surviving examples, and scientists are suggesting that a separate effort should be made to save it.

Michael Dick/Animals Animals

Some see hope and others see doom in a strategy of interbreeding.

Sumatran rhino calves are born with a long and dense coat of hair that becomes sparse and bristly in old adults because of constant wear and tear in forest undergrowth. Animals in captivity, however, become very hairy. "It's strange-looking and doesn't fit your standard image of a rhinoceros," Dr. Melnick said.

The Sumatran rhino is not the rarest rhinoceros species. That distinction goes to the Javan rhino, of which only 75 or so survive, most of them in the relative security of Ujung Kolon National Park at the western tip of the Indonesian island. But conservationists consider the Sumatran rhino to be more critically endangered because of its fragmented and poorly protected populations.

The island of Sumatra has the largest number of rhinos, but Dr. Thomas Foose, program officer for the International Rhino Foundation in Cumberland, Ohio, says the animals are found in widespread pockets and poachers are active even in areas where wildlife protection staff are present.

Like its African and Asian relatives, the Sumatran rhino has suffered from the demand for rhino body parts, especially horns, for use in Oriental medicines. The World Wildlife Fund reports that a kilogram of rhino horn, about 2.2 pounds, is worth $60,000 and is stocked by 60 percent of traditional medical practitioners in the Far East.

While there is concern about habitat loss, particularly on Sumatra, where development has become intense, it is not considered as serious a threat as poaching. Many rhinos are found in remote mountainous country, and the animals use logged areas where regenerating plants are abundant.

All efforts to breed the Sumatran rhino in zoo captivity have failed. Thirty-nine animals have been captured, 21 of them have died and not a single calf has been produced.

"There have been some stunning successes with captive breeding, but it entails tremendous problems and expense and it is not always the wisest use of conservation dollars," Dr. Melnick said. Saving wild populations in their native habitats and galvanizing local communities to help should be conservationists' priority, he said.

Dr. Foose said a plan released last September by the Asian Rhino Specialist Group of the World Conservation Union called for managed breeding populations of 50 Sumatran rhinos each at sanctuaries in Indonesia, peninsular Malaysia and Sabah. He said a 40-square-mile rhino sanctuary had been created at Way Kambas National Park in eastern Sumatra as a joint venture with the Indonesian Government, and a breeding complex with 10 large natural enclosures was being built with money from the International Rhino Foundation. Several rhinos now in zoos will be moved to Way Kambas, Dr. Foose said, adding that a lodge for tourists would be built.

He praised the genetic studies by the Columbia scientists as vital to rhino conservation efforts. Working with specimens of blood and hair from wild-born Sumatran rhinos, the researchers examined mitochrondrial DNA in cell bodies and found no genetic difference between populations on peninsular Malaysia and nearby eastern Sumatra and only slight differences between animals from eastern and western Sumatra.

In the newly published paper, Dr. Melnick and Dr. Morales, who did much of the genetic analysis, suggest that these three rhino populations "have been actually exchanging migrants until very recently" and that interbreeding the animals "is a safe and responsible step."

But the rhinos on Borneo "constitute a special case," the scientists wrote. "Because of the larger genetic divergence from other Sumatran rhinoceroses," they said, "the ideal situation would be to maintain this lineage as a separate management unit" rather than crossing the Bornean animals with those from the Malay peninsula and Sumatra.